

Basic Plant Pathology



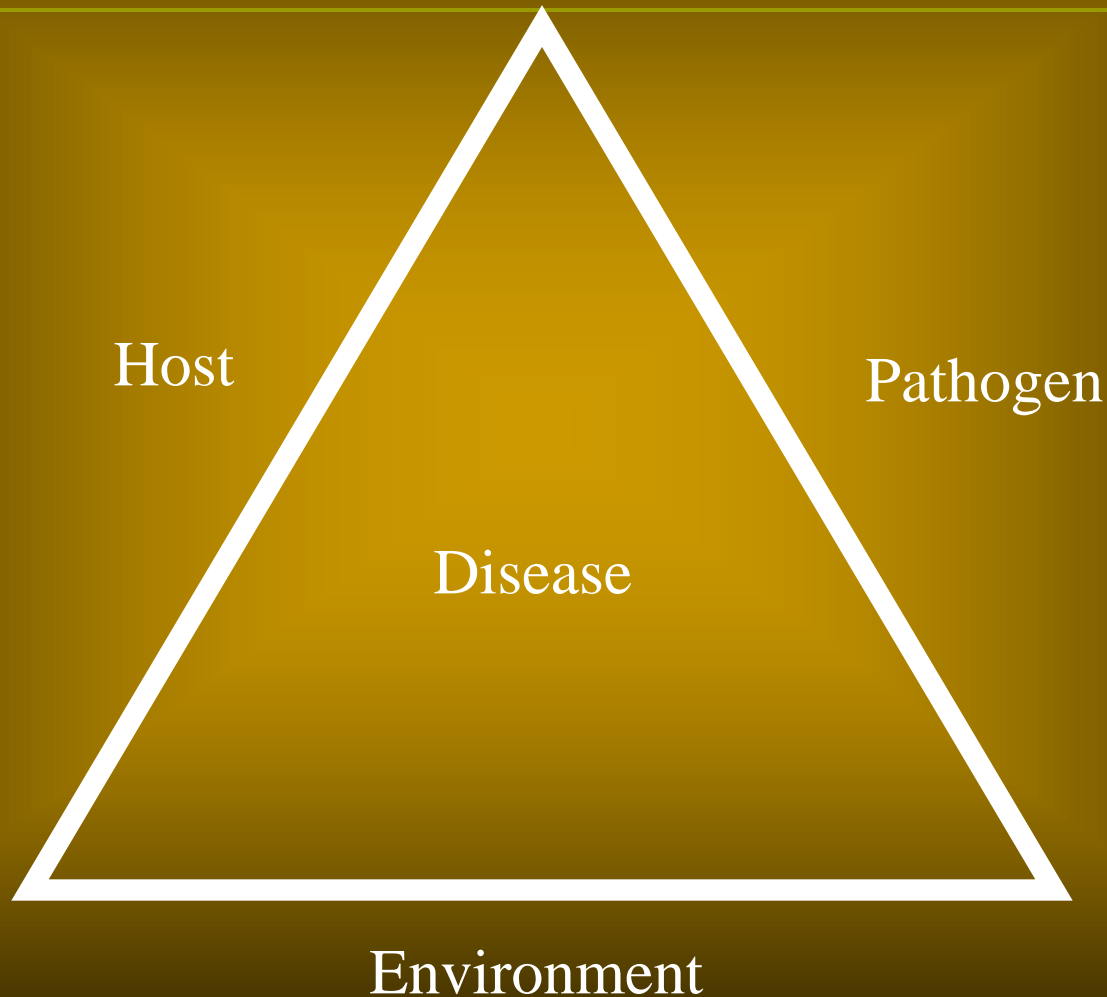
Jennifer Davidson

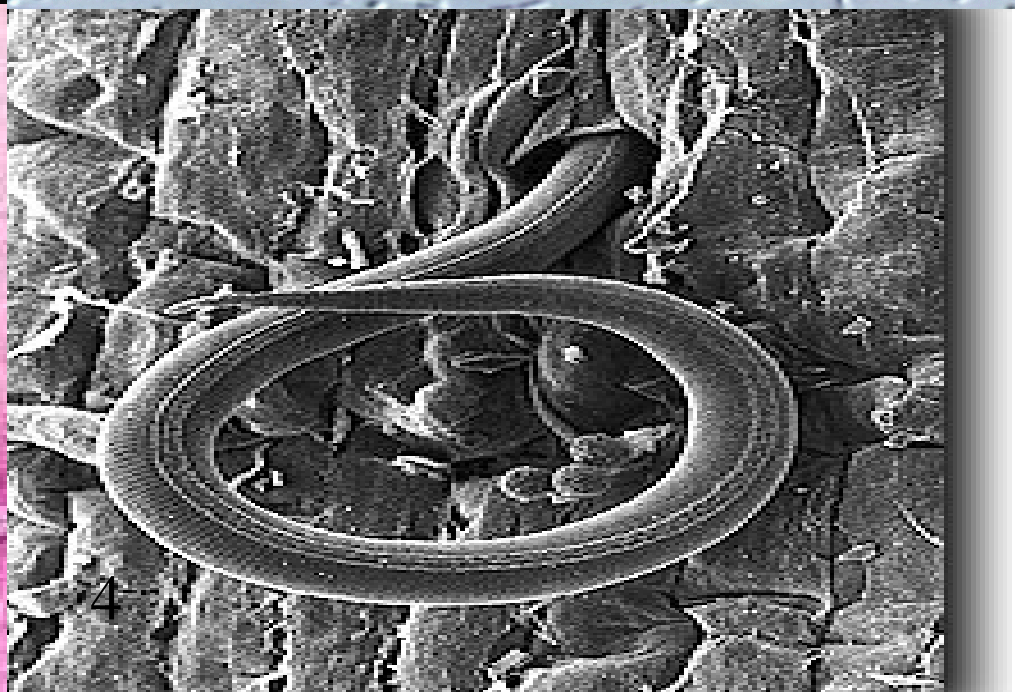
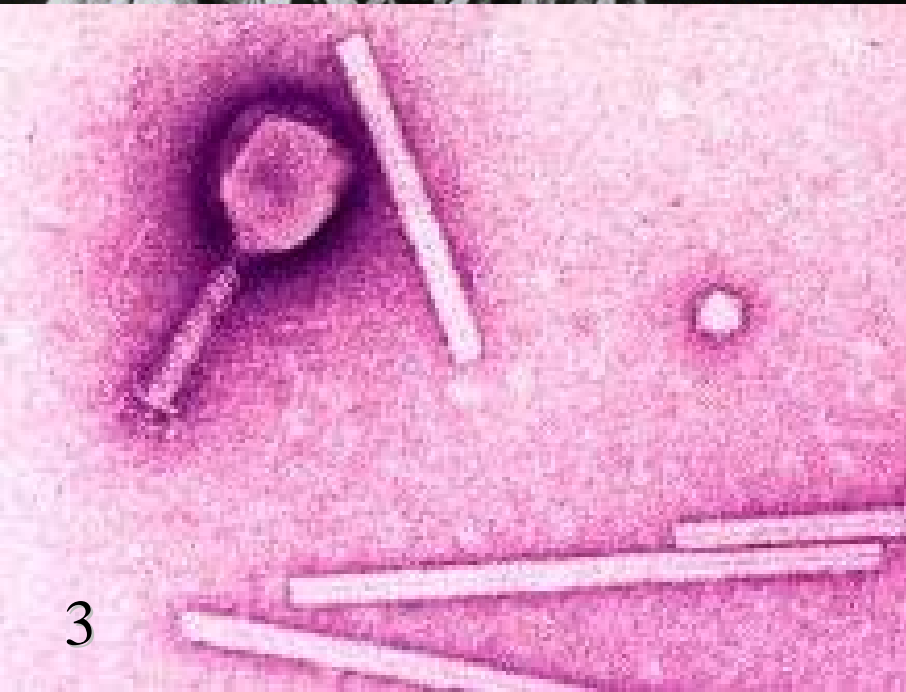
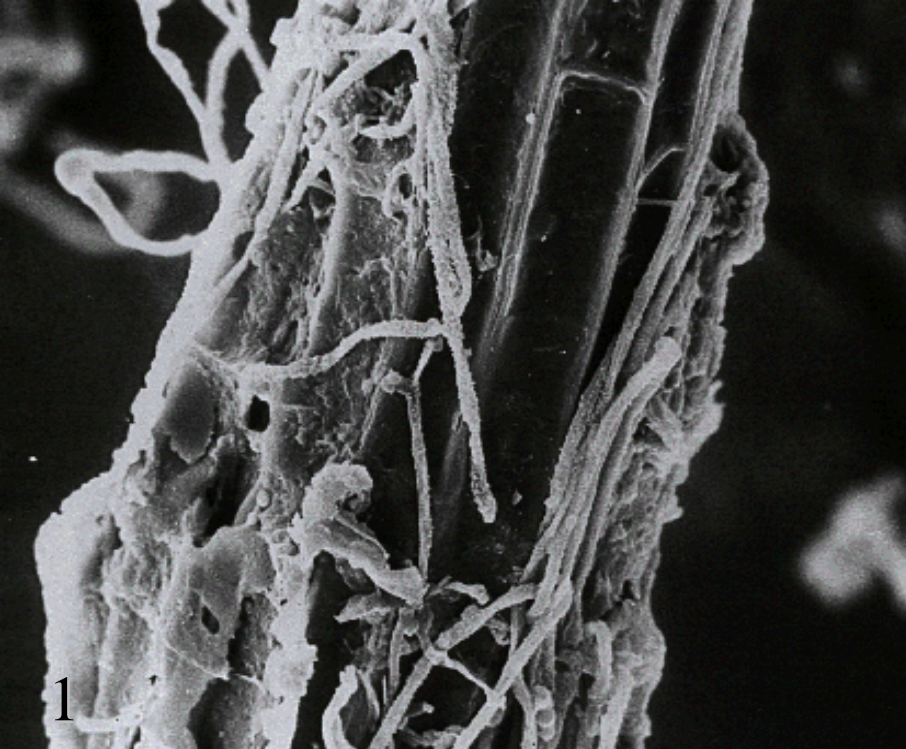
Mahbubul Alam_CST-06_RU

Learning Objectives

- ❑ Define plant pathology
- ❑ Economic importance of plant diseases
- ❑ Pathogenic and Non-pathenogenic diseases
- ❑ Disease triangle
- ❑ Fungal diseases, fungi reproduction and fungal infection
- ❑ Viruses and how viruses are spread
- ❑ How diseases are caused by nematodes

Disease Triangle





Fungi

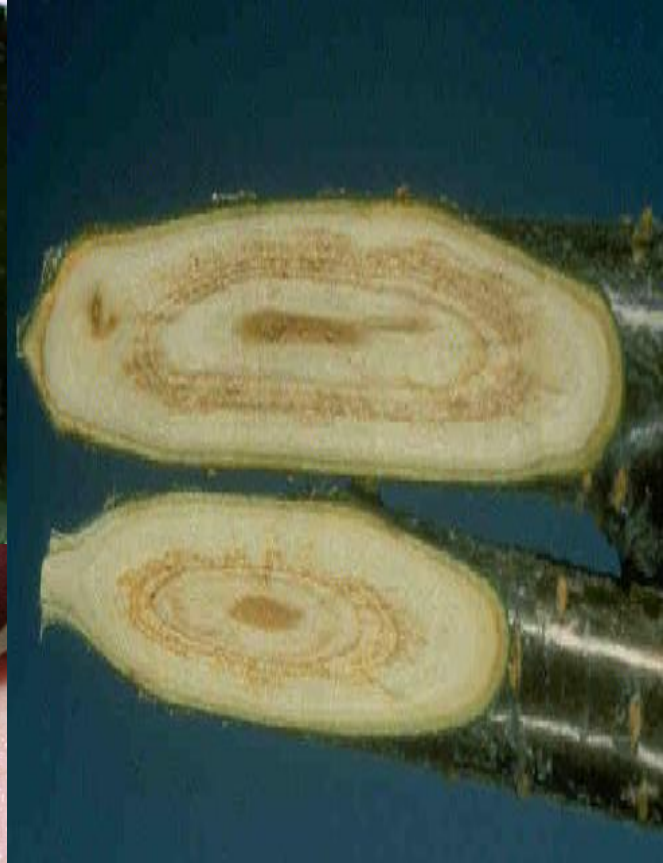


Rust

Leaf spot

Wilt

canker

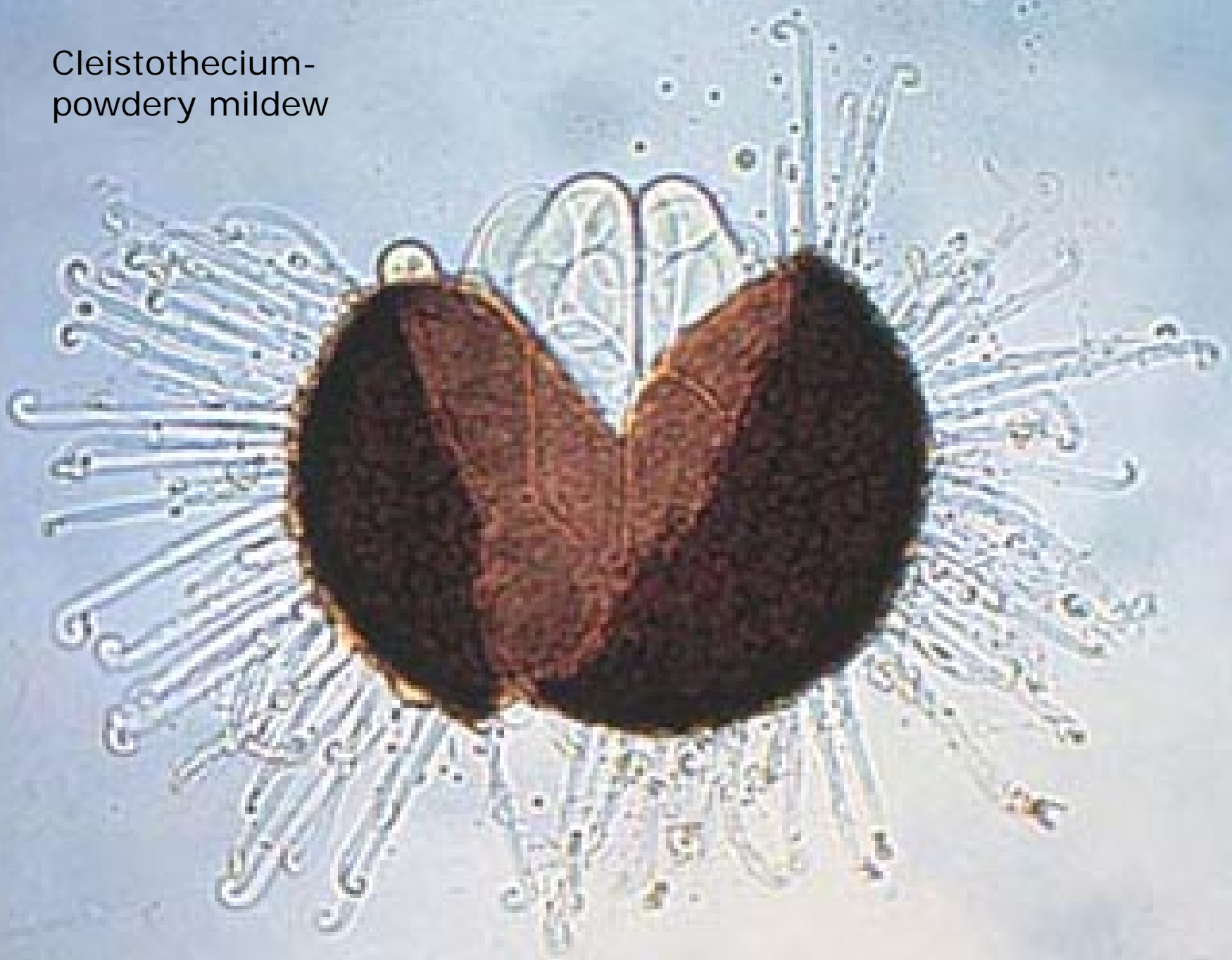


Hyphae —————> Mycelia



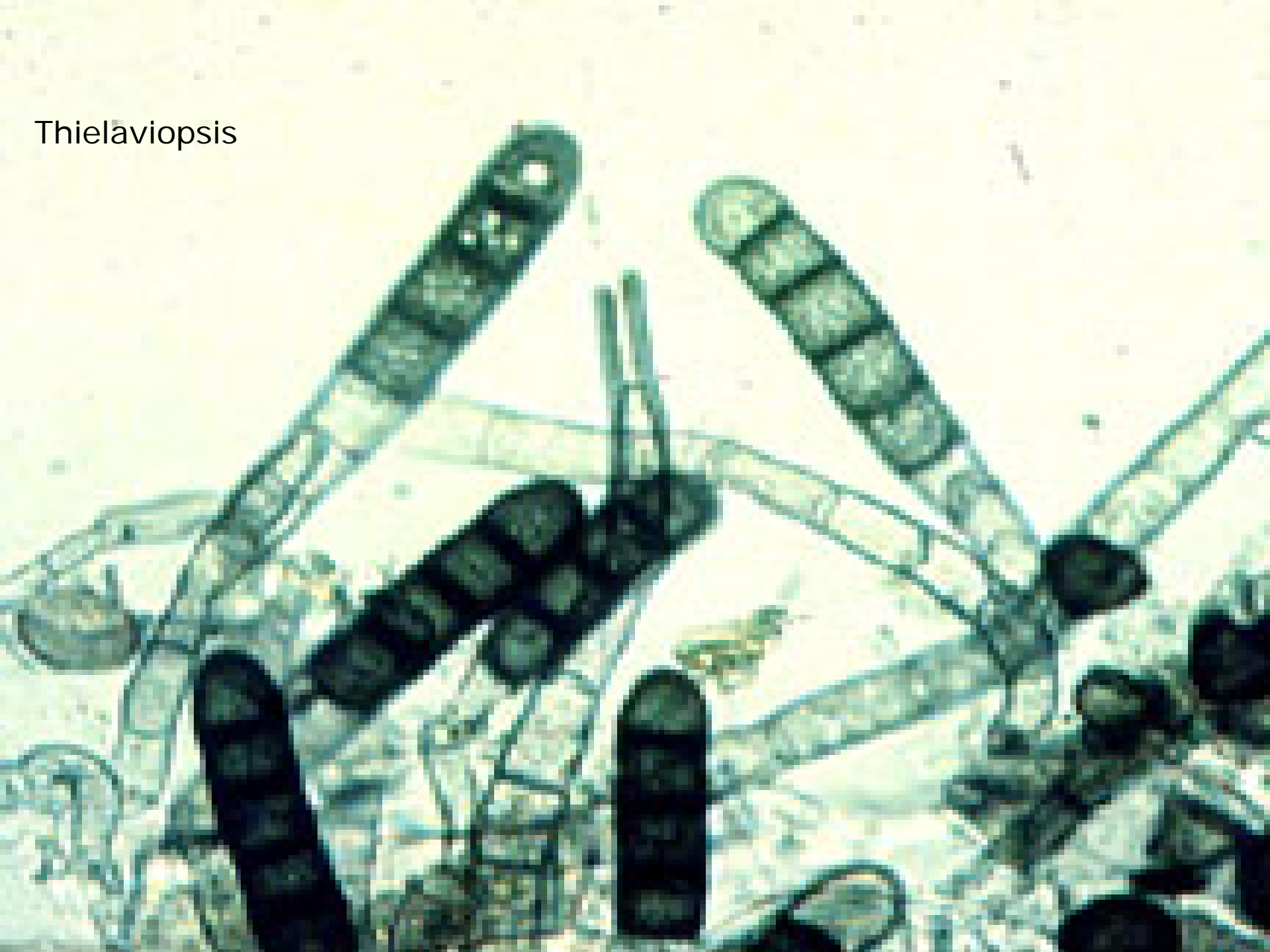


Cleistothecium-
powdery mildew

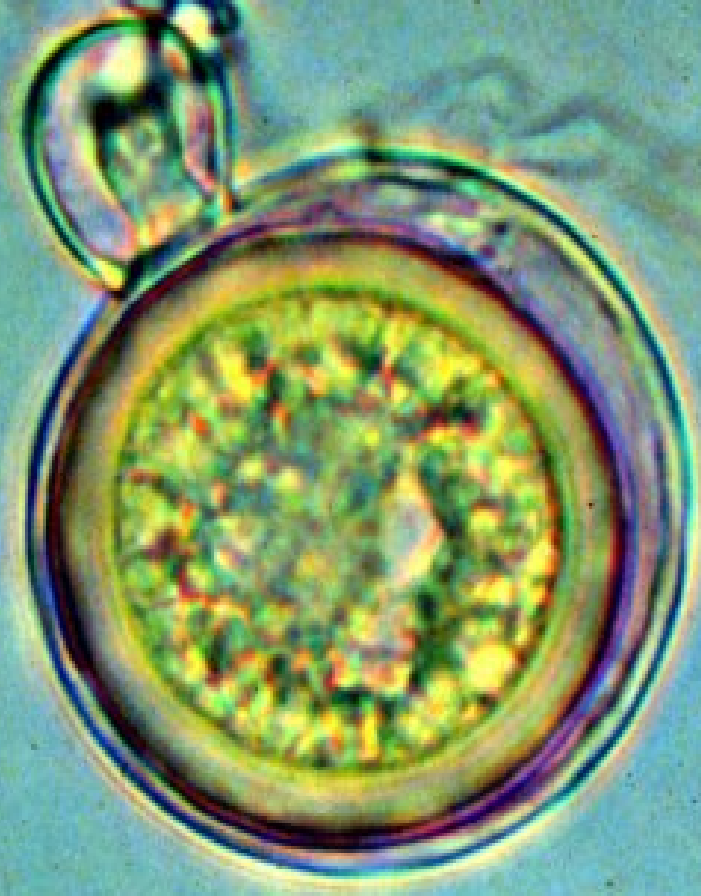




Thielaviopsis



Oospore-
Pythium



bacteria

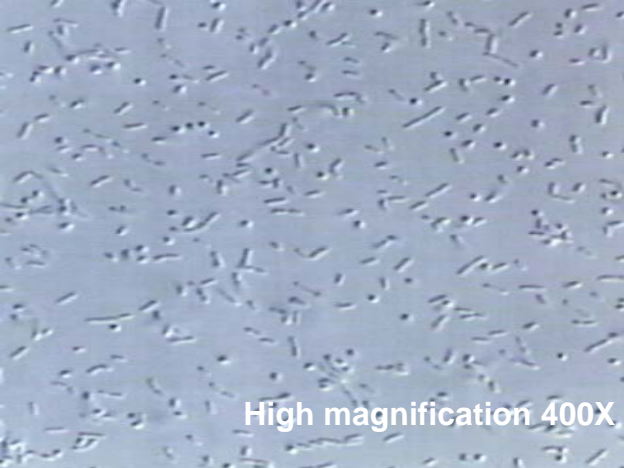


Scorch

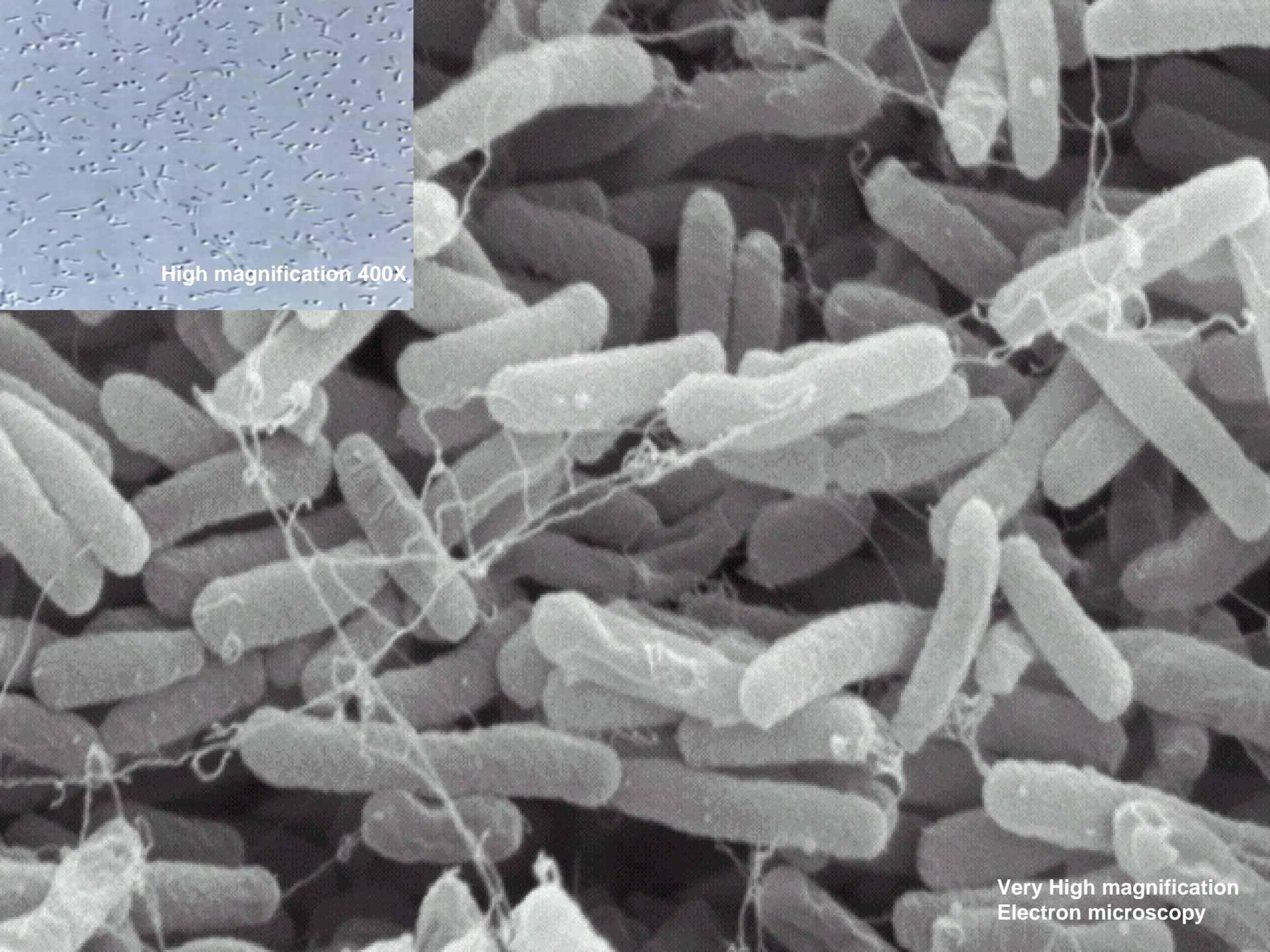
Wilt

fireblight





High magnification 400X

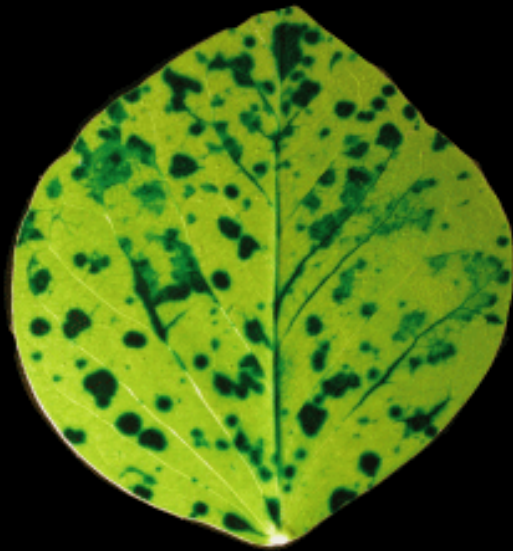


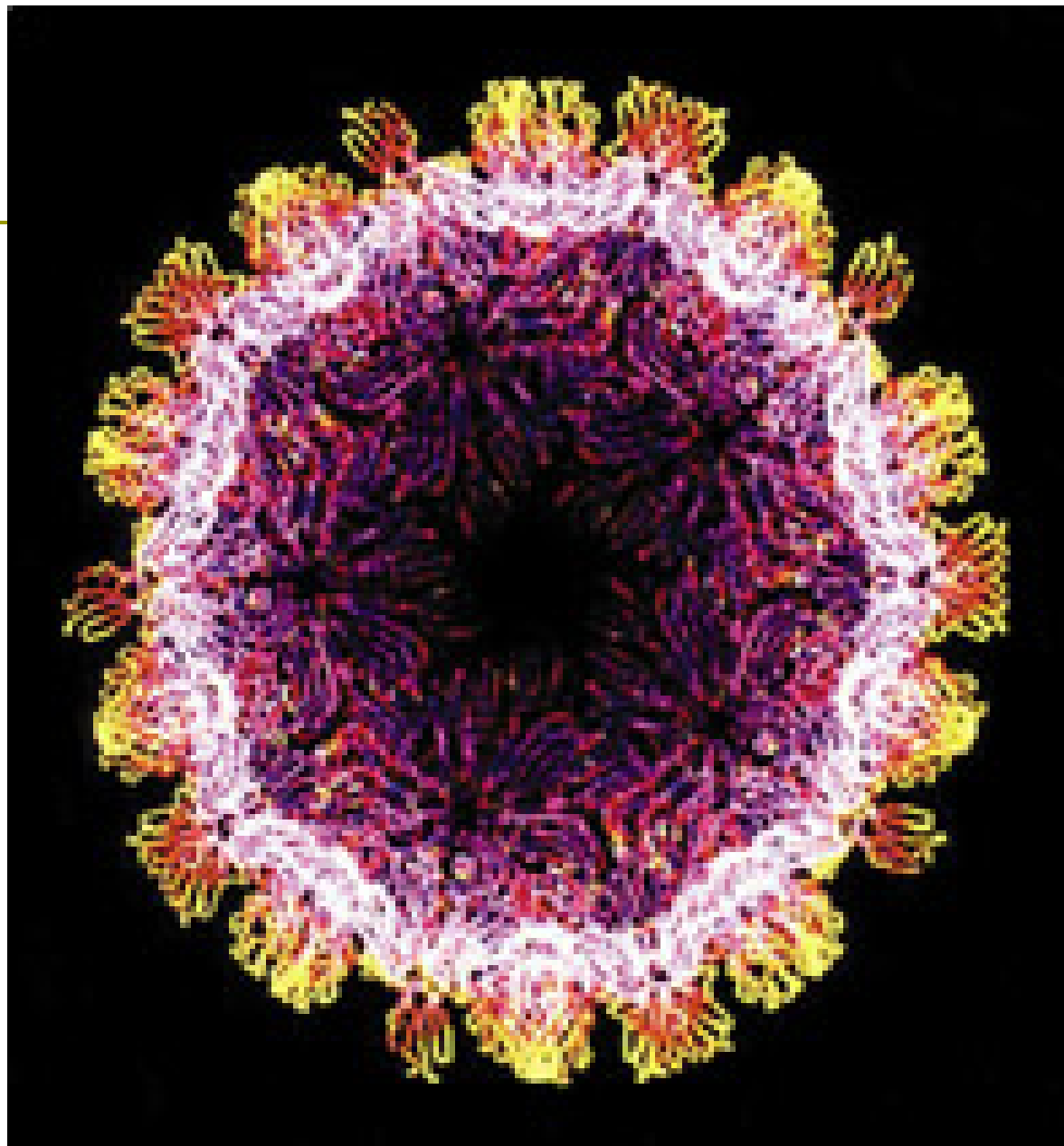
Very High magnification
Electron microscopy

Virus



Tobacco -Mosaic





Nematodes



Root knot





BREAK



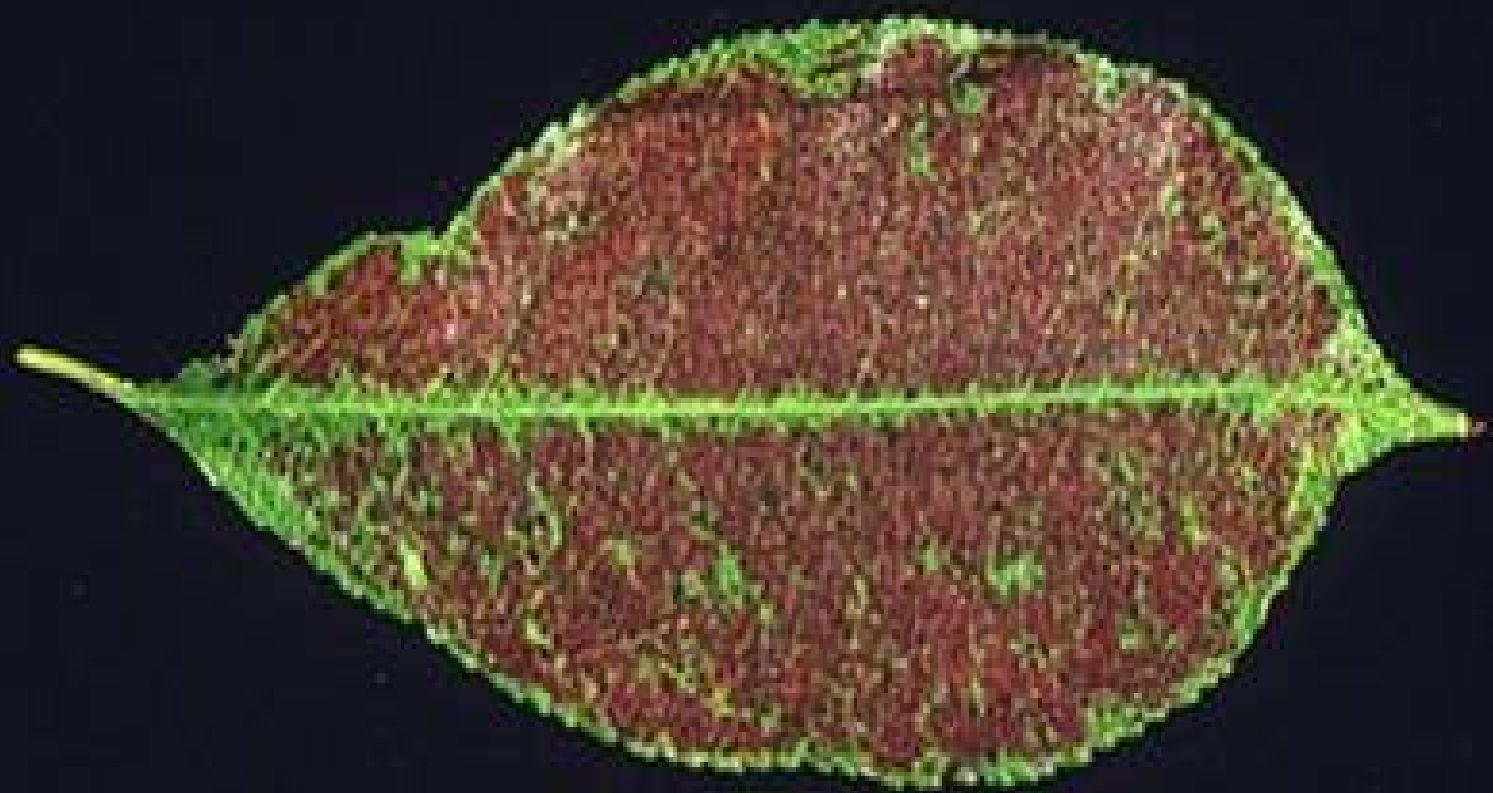
Plant Problems

Not Caused by Disease

- ❑ Cultural
- ❑ Environmental











Cultural Disease Controls

- ❑ Avoiding the pathogen
- ❑ Buy seed from a reputable source
- ❑ Inspect plants prior to purchase
- ❑ Control alternate hosts

Cultural Disease Control

- ❑ Avoiding conducive environmental conditions
- ❑ Moderate soil moisture
- ❑ Reduce humidity
- ❑ Fertilize plants properly
- ❑ Be aware of activities surrounding your plants

Cultural Disease Controls

- ❑ Sanitation
- ❑ Disinfest tools
- ❑ Remove diseases plants promptly
- ❑ Remove senescent plant parts promptly



Chemical Disease Control

- ❑ Fungicides, bactericides, nematocides
- ❑ Protectants
- ❑ Systemics
- ❑ Fumigants

Resistant Plants

ASK QUESTIONS!!!!

Which disease?

Are diseases in your
area?

Has it been tested?

PLANTS MAY LOSE
RESISTANCE



Nearly Wild Roses.....

Common Plant Diseases in the Landscape



Seridium Canker

- This disease is particularly prevalent on drought stressed Leyland Cypress trees during hot weather.
- Fungus *Seiridium unicorne*.
- **Symptoms:** Yellowing and browning of old foliage precedes fading and death of twigs and branches. Sunken, long cankers with a reddish tinge develop at wounds on bark, bark is darkened and resin exudes from margins of cankers. Infection can occur on any part of the plant and stage of the tree. Infected trees look thinly branched.



Leaf Rusts

- ❑ Leaf rust diseases are common on roses, snapdragons, hollyhocks, crabapple, and most recently, daylilies. The most diagnostic sign of the disease are the raised pustules that rupture to release powdery, orange to rust-colored spores on the underside of the affected leaf.



Rhizoctonia Root Rot

- ▣ They occur in wet soils with limited soil drainage (porosity) or in areas that are over-watered or remain wet due to location of gutters and downspouts, air conditioning units and slopes, etc. All landscape plants (trees, shrubs and flowers) are susceptible to root rot.



Damping Off

Pythium Root Rot



Brown, necrotic roots

- Plants attacked by soil-borne pathogens may be stunted, develop lesions at the soil line, or wilt and collapse. When larger plants become infected with root rot pathogens, aboveground symptoms include poor growth, off-color foliage, yellowing and dropping of lower leaves, wilting and death. Infected roots are usually brown, soft and decayed. Some root rot pathogens invade the lower stem as well, causing tan, dry cankers or a soft, dark-brown, watery stem rot

Powdery Mildew

- ❑ Powdery mildew is characterized by the presence of whitish fungal growth on the surfaces of leaves, stems, and flowers. Infection of young, expanding leaves or shoots can result in severe distortion.
- ❑ Very common on pruned crapemyrtles.



Leaf Gall, Exobasidium

- Common on azalea, rhododendron, mountain laurel (*Kalmia*) and camellia in the spring during wet, humid, cool weather. Infection only occurs at leaf or flower bud break if favorable environmental conditions exist.



Fire Blight

- ❑ Fireblight is a destructive, highly infectious and widespread disease caused by the bacterium *Erwinia amylovora*. Fireblight affects plants in the Rosaceae family such as pear, crabapple, cotoneaster, photinia, pyracantha, quince, etc.



Botrytis Blight



- The fungus commonly invades wounded or senescent tissue, such as fallen flower petals or other fresh plant residues. It can also invade healthy tissue in contact with infected residues. Masses of fuzzy, grayish-brown spores on thin black stalks develop on infected plant tissues under cool, moist, humid, cloudy conditions.

Sooty Mold



- ❑ Fungus that grows on the secretions of piercing sucking insects such as aphids, whitefly.
- ❑ Remove the food sources, the fungus will go away.

Bacterial Diseases

- ❑ Leaf spots are initially water-soaked or greasy in appearance, often angular, and concentrated along leaf veins or margins
- ❑ Requires water to enter leaf
- ❑ Fungus gnat larvae can spread soft rot bacteria



Viral Diseases

- ❑ Virus symptoms are often quite striking and distinctive. Chlorotic mottling, ringspots and line patterns on the foliage or stems may occur.
- ❑ Stunting is commonly observed.
- ❑ Destroy plants, rid area of vectors.



Yellow Ringspot
Pattern on Lily

Turf Diseases

See pathology reports!

Questions?

What are the two types of plant diseases?

What three factors are required for a pathogenic disease?

How are viruses spread?

What are nematodes and how can they cause plant disease?

How can plant diseases be controlled?

